

## A TAXONOMIC STUDY ON THE GENUS *BALMES NAVÁS* FROM CHINA (NEUROPTERA, PSYCHOPSIDAE)

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**Abstract** The Chinese species of psychopsid genus *Balmes Navás*, 1910 is revised. Five species are recognized: *Balmes birmanus* MacLachlan, *B. chikuni* sp. nov., *B. formosus* (Kuwayama), *B. notabilis* Navás and *B. terissinus* Navás. A checklist and a key to the Chinese known species of *Balmes* are provided. *Balmes chikuni* sp. nov. is described and illustrated.

**Key words** Neuroptera, Psychopsidae, *Balmes Navás*, checklist, new species.

### 1 Introduction

Psychopsidae, silky lacewings, is a small family of Neuroptera and 6 genera and 26 species were reported worldwide. Their distribution is Afrotropical, Australian and Oriental Regions. At present, the genus *Balmes Navás* is the only known genus of Psychopsidae from China.

The genus *Balmes* was erected by Navás in 1910 for the species *B. terissinus* occurs in Tibet, China. The systematic position of *Balmes* has appeared different perspectives. Kimmins (1939) and Oswald (1993) regard *Balmes* as valid, but New (1988) demoted *Balmes* to a subject synonym of the genus *Psychopsis*. We agree with the opinion of Kimmins and Oswald, because *Balmes* can be easily distinguished from other genera of Psychopsidae by the particular wing venation and pattern. On the other hand, this genus was discovered only in Oriental Region.

Oswald (1995) published 'Revision of the southeast Asian silky Lacewing genus *Balmes*'. Four species of *Balmes* are recognized in this paper, based on observation upon approximately 40 adult *Balmes* specimens, which were preserved in some museums located in America, Japan, England and France. He noted 'The few elevation records available for *Balmes* species (all for mainland species) range between 600 and 1 825 meters, suggesting the *Balmes* species are montane.' The elevation record of *B. chikuni* sp. nov. is only 240 meters. This valuable discovery suggested the genus *Balmes* can live in lower altitude area.

*Balmes birmanus* is very similar to *B. notabilis* in wing venation and pattern. Kimmins (1939) recognized *B. notabilis* as synonym of *B. birmanus*.

New (1988) have the same opinion with Kimmins (1939) and moved them into *Psychopsis*. *B. notabilis* was removed from the synonym of *B. birmanus* and re-established as a valid species by Oswald (1995). Oswald distinguished this two species based on male terminalia anatomized structures. We agreed basically that *B. notabilis* is a valid species. But these two species in China occur all in Yunnan Province, otherwise, another three species each distribute in different provinces. Perhaps *B. birmanus* and *B. notabilis* have a very close sister-group relationship, but the possibility that *B. notabilis* is a synonym of *B. birmanus* would not be excluded absolute.

### 2 Materials and Methods

The studied material is the Psychopsidae specimens deposited in the Entomological Museum of China Agricultural University and the Museum of Institute of Zoology, Chinese Academy of Sciences.

The pictures of integral specimens are taken using digital camera. The photos of partial character of specimens are taken using the image obtain-analysis software linking microscope.

### 3 Genus *Balmes Navás*, 1910

*Balmes Navás*, 1910: 85.

*Psychopsella* Tillyard, 1919: 780.

*Orientichopsis* Kuwayama, 1927: 123.

Type species: *Balmes terissinus* Navás, 1910: 85, monotype

Diagnosis. Body length 5-12 mm. Wingspan 24-44 mm. Head of hypognathous type, compound eyes large, ocelli absent, vertex hunched and with two burls, but which sometimes dimness. Antennae filiform, with about 23-31 segments and 1/3-1/2 as

long as the body length; thorax with sparse long hairs. The length of the wing is about 1.2-1.5 times as long as wide in the forewing, and 1.7-2.0 times in hindwing. Margin of wings adorn with hair spots, veins with short hairs. Internal and middle gradate series present, costal and terminal gradate series absent except in *B. formosus*. Hind wing without conspicuous large spot. Legs slender, tarsus 1 longer than each tarsus 2-5. Abdomen somewhat longer than thorax. Male. Terminalia with long hairs. 9<sup>th</sup> segment divided into two lateral sclerites, which anterior portion wide and posterior portion narrow, an often distinct yellow spot on it. 10<sup>th</sup> tergite located between two sclerites of segment 9, its posterior portion somewhat narrow, and some species with a tongue-shaped sclerite on the middle of posterior edge. 10<sup>th</sup> sternite very particular for each species. Female. Terminalia with long hairs. 9<sup>th</sup> segment divided into two lateral sclerites, which are large and close to each other. 10<sup>th</sup> tergite and sternite hidden.

#### Key to Chinese species of the genus *Balmes* Navás

1. Costal and terminal gradate series present in forewing, a large fuscous maculae looking like a map located centrally, and one small round mark just beyond the middle gradate series (Figs. 16) ..... *Balmes formosus*  
Costal and terminal gradate series absent in forewing ..... 2
2. Wings white, forewing with many distinct brown spots, middle and internal gradate series bordered by brown marks (Fig. 17) ..... *B. chikuni* sp. nov.  
Wings pale brown, no mark bordering middle and internal gradate series in forewing ..... 3
3. Forewing with 3 rows of distinct brown spots on vena triplica, M-Cu scope and the wing's hind margin (Fig. 15) ..... *B. terissinus*  
Forewing marks dim (Figs. 13-14) ..... 4
4. Male. 10<sup>th</sup> tergite trapezoid, posterior margin curved toward basis in dorsal view, tongue-shaped sclerite small and hidden in posterior view; 10<sup>th</sup> sternite posterior portion shaped like double triangles (Figs. 1-3) ..... *B. birmanus*  
Male. 10<sup>th</sup> tergite posterior margin not curved toward basis in dorsal view, tongue-shaped sclerite distinct in posterior view; 10<sup>th</sup> sternite somewhat curve towards back at middle of posterior borderline, not shaped like double triangles (Figs. 4-6) ..... *B. notabilis*

#### The species check list of *Balmes* Navás known from China

*Balmes birmanus* (MacLachlan), 1891 (Figs. 1-3, 13)

*Psychopsis birmana* MacLachlan, 1891: 321.

*Psychopsis* (*Orientichopsis*) *birmana* MacLachlan, Kuwayama, 1927: 123.

*Balmes birmana* (MacLachlan), Kimmins, 1939: 153.

Material examined. 1, Yunnan Province, Cuihu, 12 May 1942; 1, Yunnan Province, Kunming, 20 May 1941; 1, Yunnan Province, Kunming, 31 May 1941; 1, Yunnan Province,

Kunming, 12 June 1941; 1, Yunnan Province, Kunming, 19 May 1944, all coll. unknown.

Distribution. China (Yunnan), Burma (Northeastern).

*Balmes formosus* (Kuwayama), 1927 (Figs. 16)

*Psychopsis* (*Orientichopsis*) *formosa* Kuwayama, 1927: 123.

*Psychopsis formosa* Kuwayama, New 1988: 844.

*Balmes formosa* (Kuwayama), Kimmins, 1939: 153.

*Orientichopsis formosa* (Kuwayama), Yang, 1999: 131.

Material examined. 1, Fujian Province, Nanping, 26 May 1981, coll. WU Ruo-Qing. 1, Fujian Province, 20 May 1981, coll. CHEN Xue-Wen.

Distribution. China (Fujian, Taiwan).

*Balmes notabilis* Navás, 1912 (Figs. 4-6, 14)

*Balmes notabilis* Navás, 1912: 197.

Material examined. 3, 1, Yunnan Province, Lincang, 22 Apr. 1981, coll. YANG Chi-Kun; 1, Yunnan Province, Yunnan, 23 Apr. 1981, 1100 m, coll. LI Fa-Sheng; 1, Yunnan Province, 17 May 1980, 850 m, coll. unknown. 1, Yunnan Province, Wuding, 29 May 1978, 1750 m coll. XU Tian-Yi; 1, Yunnan Province, Jingdong, 3 May 1982, 1100 m, coll. YAN Su-Bai.

Distribution. China (Yunnan), Laos (Northern) and Vietnam (Northern).

*Balmes terissinus* Navás, 1910 (Figs. 7-9, 15)

*Balmes terissinus* Navás, 1910: 85.

Material examined. 2, Sichuan Province, Emei Mountain, Zhongfengsi, 15 June 1990, coll. LIU Zhi-Qi; 1, Sichuan Province, Emei Mountain, Hongchunping, 12 June 1957, 1500 m, coll. ZHENG Le-Yi; 1, Sichuan Province, Emei Mountain, Baoguosi, 21 May 1957, 600 m, coll. ZHENG Le-Yi; 11, Sichuan Province, Emei Mountain, Baoguosi, 20 May 1957, 500-750 m, coll. HUANG Ke-Qin; 1, Sichuan Province, Emei Mountain, Baoguosi, 30 May 1957, 600 m, coll. ZHENG Le-Yi; 1, Sichuan Province, Emei Mountain, Baoguosi, 6 May 1957, 600 m, coll. ZHENG Le-Yi; 1, Guizhou Province, Zunyi, 12 June 1979, 870 m, coll. Linkesuo.

Distribution. China (Sichuan, Guizhou, Tibet).

*Balmes chikuni* sp. nov. (Figs. 10-12, 17-20)

Male. Length 8.5 mm, wingspan 31.5 mm, length of forewing 15 mm, length of hindwing 12 mm.

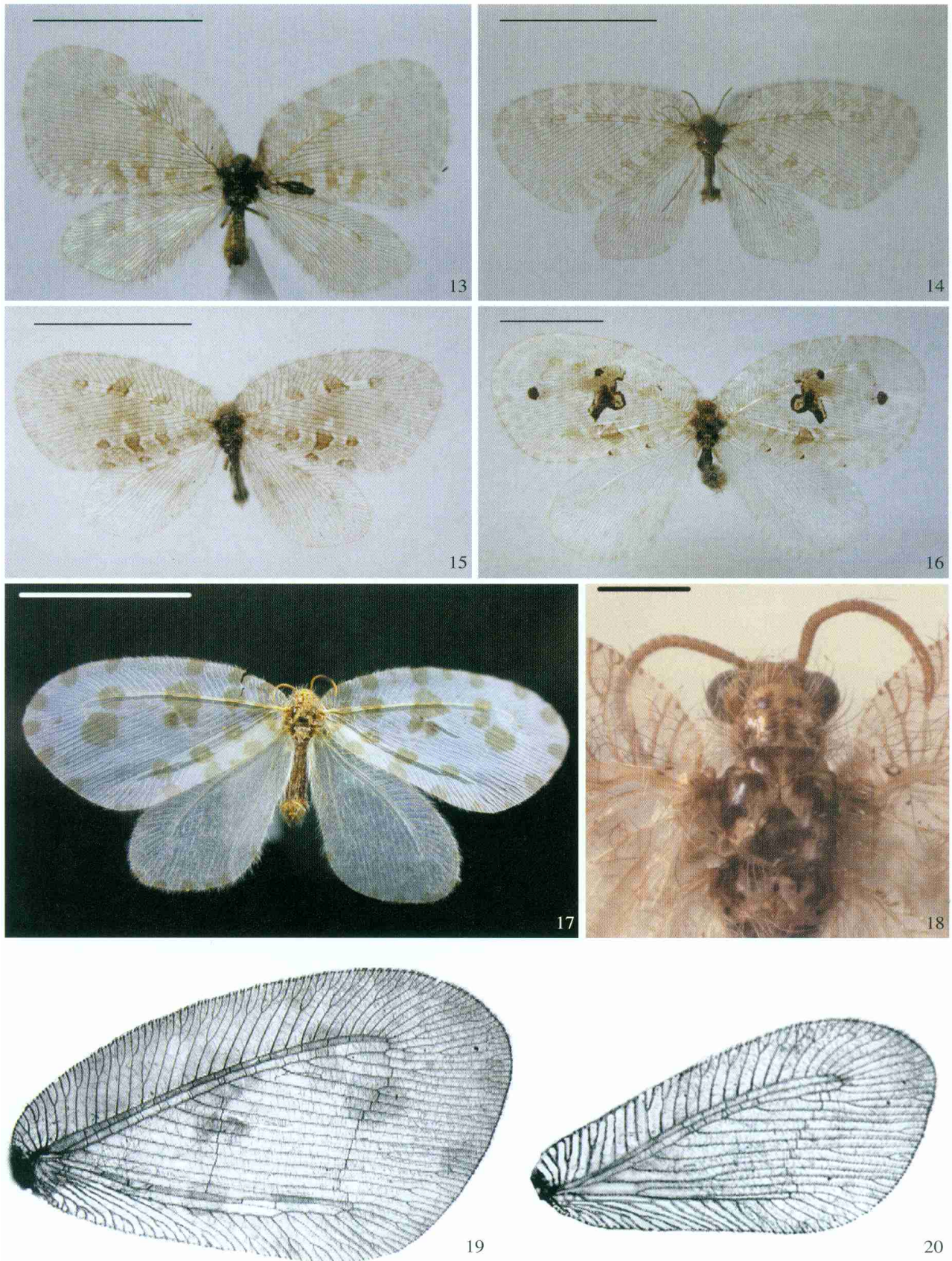
Head. Front pale brown, clypeus yellow, dark brown between antennae and vertex pale brown with





Figs. 1-3. *Balmes birmanus* MacLachlan terminalia . 1. Dorsal view. 2. Posterior view. 3. Ventral view. Figs. 4-6. *Balmes notabilis* Navás terminalia . 4. Dorsal view. 5. Posterior view. 6. Ventral view. Figs. 7-9. *Balmes terissinus* Navás terminalia . 7. Dorsal view. 8. Posterior view. 9. Ventral view. Figs. 10-12. *Balmes chikuni* sp. nov., terminalia . 10. Dorsal view. 11. Posterior view. 12. Ventral view. Scale bar = 0.5 mm.





Figs. 13-16. Panorama of 4 species. 13. *Balmes birmanus* MacLachlan. 14. *Balmes notabilis* Navás. 15. *Balmes terissinus* Navás. 16. *Balmes formosus* (Kuwayama). Scale bar = 1 cm. Figs. 17-20. *Balmes chikuni* sp. nov. 17. Panorama. 18. Head and thorax dorsal view. 19. Venation of forewing. 20. Venation of hindwing. Scale bar: 17-18 = 1 cm.

tow yellow burls. Antennae 31-jointed with dense pale pubescences. Thorax yellow, pronotum with tow cross-rows of dark maculae, and covered with numerous long grayish hairs. Mesonotum with dark maculae almost united, but yellow in both anterolateral edges, middle straight line and tow lateral sides of scutellum. Metanotum black with W-shaped yellow marking, metascutellum yellow. Mesor and metanotum sparsely covered with long grayish hairs. Legs pale brown with dense pubescences, tarsi slightly infuscated, claws brown. Wings white and translucence. Forewing with many approximate roundish brown maculae. Hindwing only outboard with several small brown spots (Fig. 17). Internal and middle gradate series present, costal and terminal gradate series absent,  $M_{3+4}$  parallel to  $Cu_1$ , and 5 cross-veins between  $M_{3+4}$  and  $Cu_1$  before middle gradate series in fore wing; Abdomen 1-8 segments brown, both sides somewhat dark. Terminalia yellow, densely set with long, pale hairs. Posterior portion of 10<sup>th</sup> tergite narrow, with a pair of dorsal calli (Fig. 10). 10<sup>th</sup> sternite bifurcated two lobes in posterior view (Fig. 11), and a ventral hole present between the 9<sup>th</sup> and 10<sup>th</sup> sternites (Fig. 12).

Holotype, Guangxi, Nonggang, 240 m, 19 May 1982, coll. YANG Chi-Kun.

Distribution. China (Guangxi).

Etymology. This rare specimen of new species was by YANG Chi-Kun collected. So this name is proposed as commemoration of him.

Remarks. The new species is can be distinguished from other species by its wing color and pattern, as

well as its male terminalia, which are very different from other species of *Balmes*.

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## 中国巴蝶蛉属分类研究 (脉翅目, 蝶蛉科)

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**摘 要** 对中国巴蝶蛉属 *Balmes* Navás, 1910 进行了分类研究和厘定, 确认巴蝶蛉属中国有 5 种: 滇缅蝶蛉 *Balmes birmanus* MacLachlan, 集昆蝶蛉 *Balmes chikuni* sp. nov., 丽东蝶蛉 *Balmes formosus* (Kuwayama), 显赫蝶蛉 *Balmes notabilis*

**关键词** 脉翅目, 蝶蛉科, 巴蝶蛉属, 修订名录, 新种.

**中图分类号** Q969.38

Navás 和川贵蝶蛉 *Balmes terissinus* Navás. 提供了这 5 个种的修订名录及分种检索表, 对新种进行了描述, 附形态特征影像。